Star's No.		Mag-nitude.	R.A. 1845, Jan. 1.	Annual Precess.	No. of Obs.	N.P.D. 1845, Jan. 1.	Annual Precess.	No. of Obs.
			h m s	s +		o ' "	" −	
15	B.A.C. 8242	7·8	23 33 41·93	3·214	6	133 7 34·5	19·92	4
17	Lacaille 9739	8	0 1 5·62	3·065	9	130 35 58·4	20·05	8
18	Lacaille 9757	8	3 26·93	3·053	6	131 14 6·9	20·05	9
19	Lacaille 50	7·8	13 10·70	3·006	9	130 5 57·2	20·02	6
20	Lacaille 126	8·9	26 2·46	2·945	7	129 32 24·9	19·93	5
21	B.A.C. 144	8	27 5·20	2·944	5	128 51 4·8	19·91	8
22	Lacaille 216	8	40 6·80	2·890	7	127 46 21·4	19·75	13
23	Lacaille 304	7·8	0 59 0·63	2·827	10	125 37 42·6	19·39	10
24		8	1 14 28·18	2·782	14	124 2 48·8	19·01	7
25		7	19 49·64	2·770	13	123 20 55·0	18·85	9
26		8·9	21 45·06	2·769	5	122 50 33·5	18·79	7
28		9	36 43·60	2·747	7	120 35 45·3	18·29	3
27		9	36 53·32	2·734	6	121 30 32·8	18·29	8
29	Lacaille 535	8	42 53·18	2·738	13	119 48 42·7	18·07	6
30		9·10	48 28·39	2·740	6	118 28 28·1	17·85	6
31		9	52 43·81	2·732	6	118 13 34·8	17·68	5
32		8·9	1 55 31·57	2·734	7	117 29 29·4	17·56	6
33		10	2 6 29·92	2·728	7	116 3 43·3	17·08	3
34		9	12 57·26	2·726	4	115 11 41·4	16·77	5
35	Lacaille 787	7·8	27 31·74	2·736	11	112 36 34·1	16·04	8
36		8·9	31 30·45	2·744	9	111 42 42·1	15·83	10
37		8·9	35 31·75	2·745	4	111 12 3·4	15·61	5
39	Lalande 5621	8	2 54 9·97	2·774	6	107 51 1·0	14·54	4
40		9	3 2 6·59	2·786	6	106 36 32·0	14·05	3
41	Lalande 6492	7·8	22 50·24	2·847	13	102 10 42·9	12·70	10
42	Weisse iii, 476	8	25 51·45	2·854	7	101 42 9·1	12·49	5
44	Weisse iii, 650	8	33 53·66	2·887	12	99 41 43·9	11·94	5
43	δ Eridani	3·4	35 49·58	2·874	9	100 17 31·5	11·80	3
45	Weisse iii, 746	7	38 28·57	2·888	12	99 29 49·3	11·61	2
46	Lalande 7246	7	47 10·74	2·906	10	98 22 1·6	10·98	6
47	Lalande 7370	7	3 50 37·19	2·904	7	97 23 33·2	10·73	4

On the Form of the Planet Saturn.   By the Rev. R. Main.

Sir W. Herschel, from repeated estimations with various telescopes made with the greatest care (and assuredly with the most practised eye and unbiassed judgment ever brought to such a task), convinced himself that the figure of *Saturn* was not elliptical, but "like a parallelogram with the corners rounded off." He was also

of opinion that the northern and southern polar regions were of a very different shape. This latter opinion was also held by his son, Sir John Herschel. The disappearance of the ring, which happened towards the end of last year, induced Mr. Main to undertake a large series of micrometrical observations, which confirmed the impression he had received from mere inspection, that the form of *Saturn*, without his ring, is a perfect ellipse of considerable ellipticity.

The observations were made with the large telescope by Cauchoix, mounted equatoreally, and the divided eye-piece micrometer. Up to October 25, 1848, the eye-piece was used which is described in the Greenwich *Observations*, 1840, *et seq.*, and after that time an improved eyepiece, on the same principle, was employed. This latter construction, which is greatly preferred by Mr. Main, as giving each image equally good in every part of the field and with better definition, is described by the Astronomer Royal in vol. xv. of our *Memoirs*. The results of the two micrometers seem, however, of equal value.

Mr. Main gives, in full detail, measures of the planet in and near the polar and equatoreal diameters, and in and near the intermediate directions. After shewing that a slight error in the assumed angular direction of the pole cannot sensibly affect the ellipticity, Mr. Main gives the following table of the measures of the diameters reduced to arc at a mean distance, log. $= 0.95$.

Apparent Diameters of *Saturn* : Distance $= [0.95.]$

		Equatoreal.	Polar.	Inclined.	Transverse.
		"	"	"	"
1848. Sept.	6	19.16	16.83		
	18	18.82	16.66		
	19	18.65	16.78		18.00
	20	18.53	16.46	17.32	17.70
	22	18.75	16.44	17.58	17.58
Oct.	5	18.84	16.44	17.29	17.53
	9	18.41	16.34	17.41	17.46
	25	18.62	16.54	17.34	17.78
Nov.	15	18.18	16.58	17.41	17.76
	21	18.65	16.77	17.60	17.90
1849. Jan.	26	18.83	16.77	17.92	18.33

Mr. Main remarks, 1st, That the absolute measures vary on different evenings considerably beyond the limits of the probable errors of the observations, for which the only obvious cause seems to be a change in atmospheric circumstances. 2. That the change seems to affect the measures in all directions pretty equally, except that the measures of the polar diameter seem somewhat more consistent, which may be due to the lateral tremor produced by the clock-work, or to the air being more disturbed horizontally than vertically.

From the above measures, adopting a formula supplied by the Astronomer Royal, Mr. Main finds the ellipticity, or $\frac{a-b}{a}$ (a and b being the observed equatoreal and polar diameters) = 0·10925 with probable error 0·00081 ; or ellipticity $=\frac{1}{9\cdot153}$.

Mr. Main then reduces his measures of the inclined diameters to what they would have been if the two sets had been measured respectively at exactly 45° to the direction of the axis of the ring given in the *Nautical Almanac*, and finds that they are then perfectly equal. As a further proof of the perfect ellipticity of *Saturn*, Mr. Main shews that the mean of the polar and equatoreal measures is equal to the mean of the inclined measures, which should be the case, as far as the second powers of the eccentricity.

The final value of the arc subtended by the equatoreal diameter of *Saturn*, when the log. distance = 0·95, is 18″·73, and that subtended by the polar diameter at the same distance is 16″·68.*

Some Remarks on the Method of the Astronomer Royal for ascertaining the Difference between the true and spurious Disc of Venus. By Mr. Sheepshanks.

"Having understood from Mr. Adams, that he wanted some good measures of the diameter of *Venus*, I wrote to Mr. Hartnup, requesting him to apply his equatoreal to that planet. In three or four days I received the following answer :—

' *Wire Micrometer*, Means of 10 Measures.

Feb. 27   6^{h} 31^{m},   Diameter = 24·66,   Power 400
    28   5   11,   ,,   = 24·69,   ,,   180

' *Double Image Micrometer*, Means of 5 Double Measures.

Feb. 27   6^{h} 56^{m},   Diameter = 23·38,   Power 161
    28   5   40,   ,,   = 23·62,   ,,

" ' I cannot,' continues Mr. Hartnup, ' at present account for the difference between the wire-micrometer and the divided eye-piece, can you suggest anything which I can do to find it out?'

" On thinking the matter over, I hit upon a plan which I shall shortly explain ; but I learned from the Astronomer Royal, that he had used the same method eleven years ago for correcting the disc of *Venus*, and had fully developed it in the volume of Greenwich Observations for 1838, page lii.

" I have still thought the subject worth bringing before the Society; first, because the Greenwich Observations are not read as carefully or as extensively as they ought to be (witness my own

* Hence at distance 1,   Equatoreal Semidiameter = 83″·46
                  Polar .... = 74·34